The genera here described he classifies in three groups, as follows:—

"I. The first group, including the genus *Cardita* and the family *Veneridæ*, is distinguished by the reduction of the anterior and posterior laterals with regard to number and strength; on the other hand, the cardinals have strongly developed with regard to their thickness, though there is unquestionably a tendency towards the reduction of number by resorption of the posterior cardinals of higher order.

"II. The second group comprises the genus *Mactra*. In this genus just the reverse takes place as in the first group; the anterior and posterior laterals are strongly developed with regard to number and strength; on the other hand, the cardinals are almost rudimentary, while their number is greatly reduced.

"III. The third group is represented by the genus *Meiocardia*; in this genus laterals and cardinals are neither reduced in number, nor has the strength of one been increased at the expense of the other; the peculiar feature is that originally separate teeth, originating from different primary lamellæ, have become amalgamated and form composite teeth, which hardly allow their primary elements to be traced. An originally complex hinge has therefore become simplified not by disappearance of some of its elements, but by amalgamation of some of them, a feature which has not been noticed in either of the two preceding groups."

An Appendix (pp. 44–57) on the Variability of Pelecypod Shells suggests a useful "Index" of numerical value, with the figure or formula L/H (length and height placed over the average measurement, thus—$^{L}/_{H}145$); and its application, especially with the graphical method of diagram, in which, the numerical values being grouped in a horizontal line, their heights can indicate the curve of variability in a given species (see plate v.).

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

March 12th, 1902.—Sir Archibald Geikie, D.C.L., LL.D., F.R.S., Vice-President, in the Chair.

The following communication was read:—

'On Proterozoic Gasteropoda which have been referred to *Murchisonia* and *Pleurotomaria*, with Descriptions of New Subgenera and Species.' By Miss Jane Donald.

Many of the Palæozoic shells referred to *Murchisonia* do not agree with the type, and there are at least two separate groups distinguished by the outer lip. The typical group has a slit, the

other merely a sinus. As the outer lip is rarely well preserved, it is difficult and sometimes impossible to decide whether a particular individual belongs to one or other of these two types. With regard to these shells, two important questions require to be answered. Firstly, whether the slit or the sinus characterizes the more primitive type; and, secondly, whether the elongated *Murchisonia* and the shorter *Pleurotomaria* are both derived from the same stock, and which of them appears the earlier. Before considering the British evidence, the work of foreign palæontologists is reviewed by the authoress. From the material at present available, in the British Isles as well as in America and the Baltic Provinces, elongated forms with a sinus precede those with a slit. There are at least two distinct groups of sinuated shells with a band: one, containing *Hormotoma*, *Ectomaria*, etc., having the lines of growth sweeping back to and forward from the band very obliquely; and a second, containing *Lophospira*, having the lines less oblique and agreeing more in direction with those of *Murchisonia*, only the band is prominent instead of being grooved. A possible third group is indicated by a subgenus, subsequently described, in which the lines of growth are but slightly oblique and the band grooved. The first two groups in Britain range from Upper Cambrian to Silurian rocks, and the third from the Bala to the Silurian. The genus *Murchisonia* may have begun in the Wenlock Formation. So far, no light is thrown on the question as to whether *Murchisonia* and *Pleurotomaria* were derived from the same stock, nor has the authoress yet met with any specimens showing a transition from sinus to slit.

In the latter part of the paper three new subgenera, eleven new species, and one new variety are described and figured.

April 30th, 1902.—Prof. Charles Lapworth, LL.D., F.R.S., President, in the Chair.

The following communication was read:—

'Revision of the Phyllocarida from the Chemung and Waverly Groups of Pennsylvania.' By Prof. Charles Emerson Beecher, Ph.D., F.C.G.S.

The specimens described in the paper, as well as those on which the original descriptions were based, were all obtained in the vicinity of Warren, Philadelphia. The chief horizon is in the shale-beds of the Upper Chemung Group, about 50 feet above mean water-level in the Allegheny River. The deposits are called by the writer the 'Phyllocarid-Beds.' Additions and emendations to the original diagnoses of the following genera and species are given:—*Echinocaris socialis*, Beecher; *Tropidocaris*, *Tr. bicarinata*, Beecher, *Tr. alternata*, Beecher; *Elymocaris*, *E. siliqua*, Beecher; and two new species of *Echinocaris* are described.